PEND OREILLE VALLEY SCHOOL (PWSNO 1090188)
SOURCE WATER ASSESSMENT REPORT

November 5, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Pend Oreille Valley School*, describes the public drinking water wells; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

A single 172 foot deep well supplies drinking water for Pend Oreille Valley School. The water system serves a school, shop and residence in rural Bonner County, Idaho, about 4 miles south of Oldtown. Historically, Pend Oreille Valley School has had few water quality problems. A groundwater Susceptibility Analysis conducted by DEQ September 19, 2002 found the well to be at moderate risk for contamination. Unknown risk factors related to local geology and well construction added the most points to the final susceptibility scores.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Continuing to operate and maintain the well in compliance with *Idaho Rules for Public Drinking Water Systems* should be the focus of drinking water protection activities for Pend Oreille Valley School. Consistent monitoring is very important since it gives the operator both a snapshot of current conditions and a means for tracking trends that could signal a developing problem. The school should consider incorporating ground water stewardship into its curriculum to make its students aware of the ways everyday activities can affect water quality. With most of the recharge zone for Pend Oreille Valley School outside of the school's direct jurisdiction, it will be important to form ground water protection partnerships with nearby landowners, state and local agencies. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR PEND ORIELLE VALLEY SCHOOL

Section 1. Introduction - Basis for Assessment

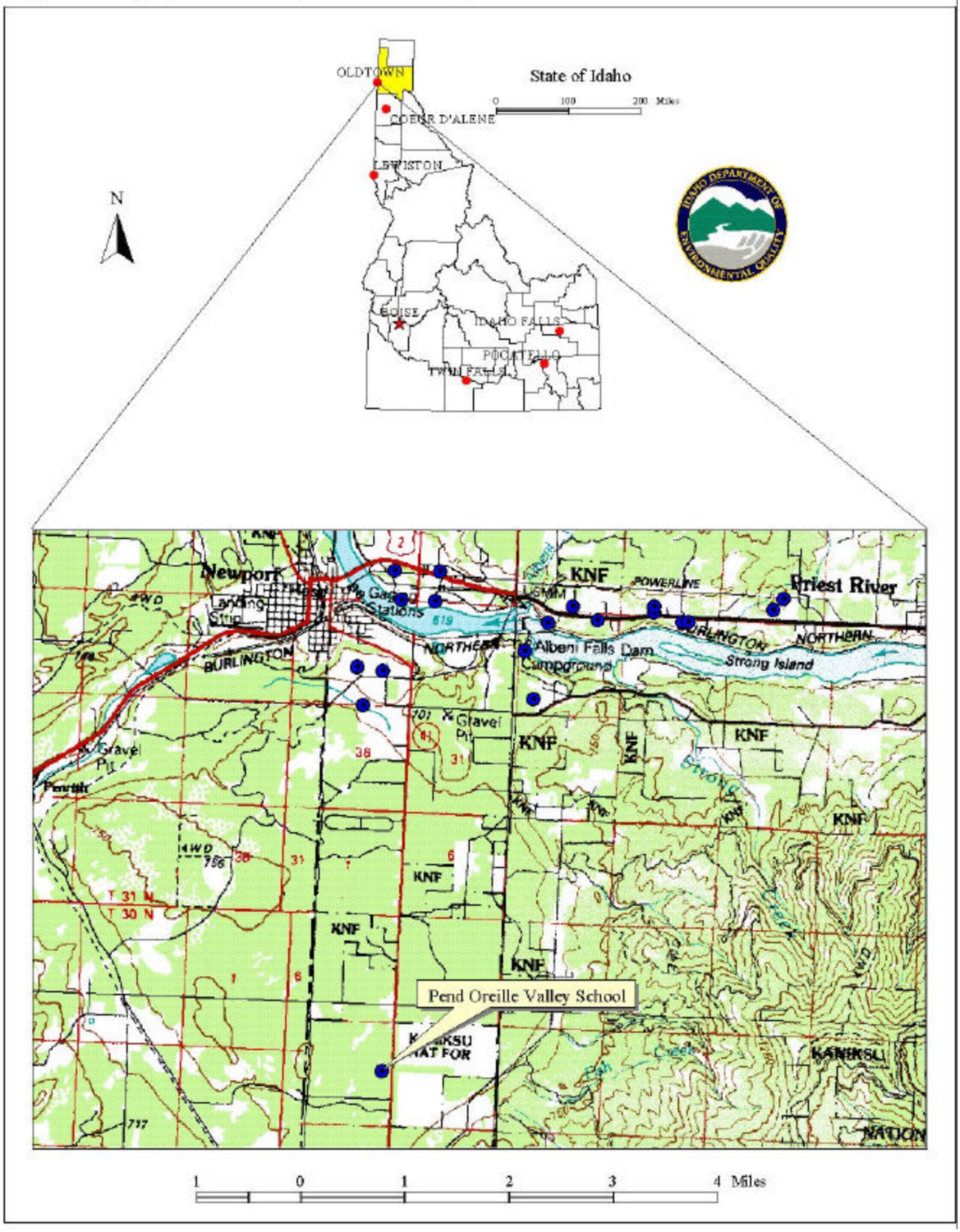
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water susceptibility analysis worksheets used to develop this assessment are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

The results of the source water assessment should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system. The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Pend Oreille Valley School



Section 2. Preparing for the Assessment

Defining the Zones of Contribution - Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment and future protection efforts. The process includes mapping the boundaries of the well recharge area into time of travel zones indicating the number of years necessary for a particle of water to reach a well. DEQ used a refined computer model approved by the EPA to determine the time of travel (TOT) zones for public water system wells. The computer model used data assimilated by DEQ from a variety of sources including the local well logs.

Pend Oreille Valley School water system a serves a school, shop and residence in rural Bonner County, Idaho about 4 miles south of Oldtown (Figure 1). A 172-foot deep well supplies drinking water for 30 students and staff members. The estimated capacity of the well is 13.5 gpm.

The delineated source water assessment area for Pend Oreille Valley School is a narrow corridor 0.63 miles long that encompasses 28.5 acres divided into 0-3, 3-6, and 6-10 year time of travel zones. (Figure 2). The primary direction of ground water flow is from the northeast toward the well.

Identifying Potential Sources of Contamination

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within the delineated source water assessment areas through the use of computer databases and Geographic Information System maps developed by DEQ. Maps and inventory lists were then sent to system operators for verification and correction in the second or enhanced part of the inventory process.

Figure 2, *Pend Oreille Valley School Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Pend Oreille Valley School well, and the zone of contribution DEQ delineated for it. Highway 41 crosses the 0-3 year time of travel zone about 0.13 miles from the well. The predominant land use in the recharge zone is undeveloped forest under private and federal ownership, and some agricultural land with scattered homes.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

Section 3. Susceptibility Analysis

The susceptibility to contamination of all groundwater sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheet in Attachment A shows in detail how the Pend Oreille Valley School well scored.

Well Construction

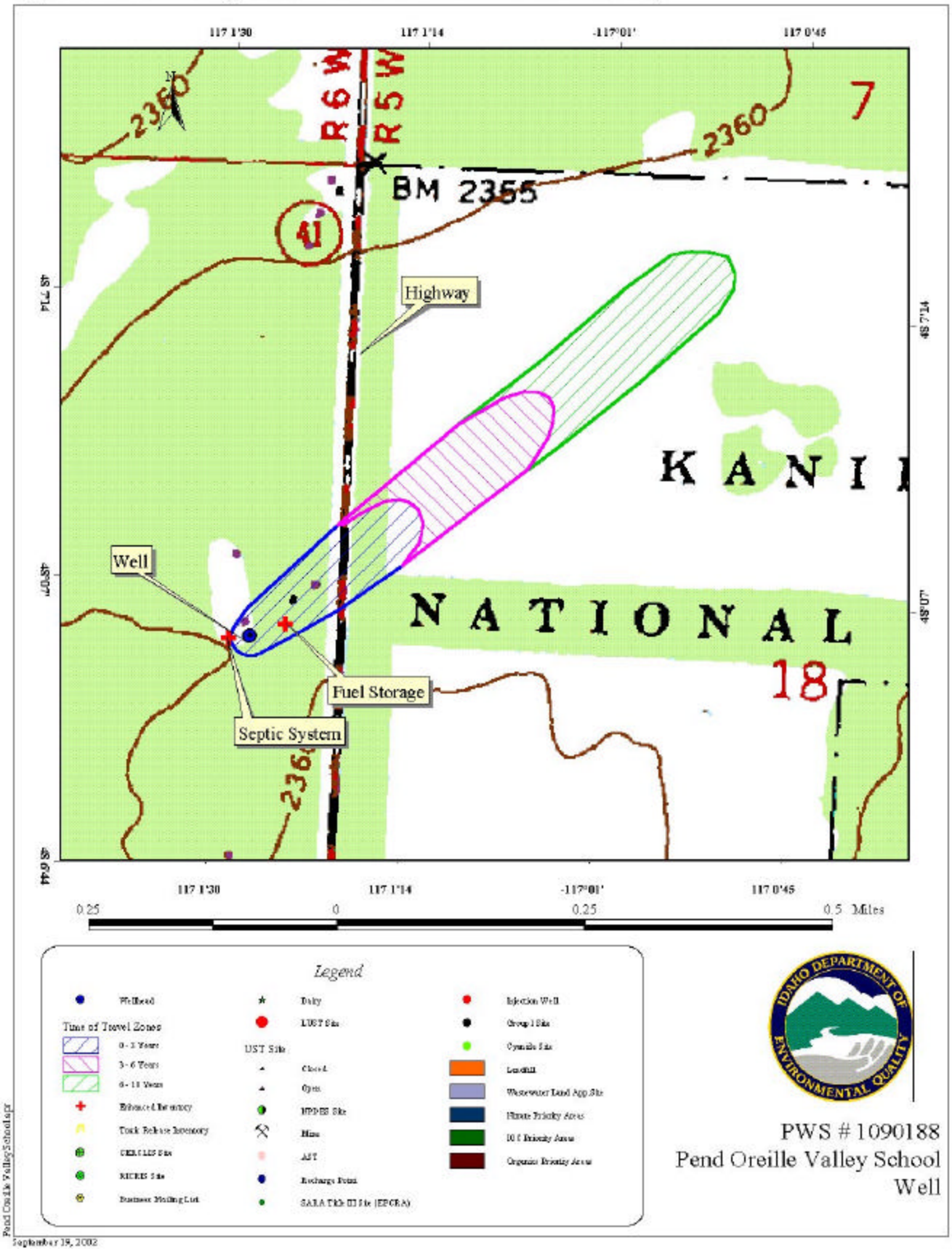
Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the susceptibility analysis relies on information from individual well logs and from the most recent sanitary survey of the public water system.

The Pend Oreille Valley School drinking water system relies on a single well extracting ground water from an unconsolidated alluvial aquifer. No well log for Pend Oreille Valley School is on file with DEQ. The well was reportedly drilled in 1974 to a depth of 172 feet. When the system was inspected in May 2002, bolts needed to maintain the sanitary seal on the well cap needed tightening and the cap needed to be properly vented. The needed repairs were completed in September. Several construction features used to assess vulnerability to contamination are unknown because the well log is not available.

Hydrologic Sensitivity

The hydrologic sensitivity score for the Pend Oreille Valley School well was 6 points out 6 points possible. The score reflects natural geologic conditions at the well site and in the recharge zone. The soils in the recharge zone as a whole are well drained. Poorly drained to moderately well drained soils are deemed more protective of ground water than soils which drain faster. The depth to ground water is less than 300 feet. Other factors being equal, a greater depth to ground water provides greater opportunity for potential contaminant attenuation through adsorption and other mechanisms. Without a well log, information about the soil composition above the water table at the well site is not available.

Figure 2. Pend Oreille Valley School Delineations and Potential Contaminant Inventory.



Potential Contaminant Sources and Land Use

Land inside the Pend Oreille Valley School well recharge zone is mostly undeveloped forest and agricultural. The public water system file for the school notes the presence of the school septic system about 100 feet west of the well. It falls just outside the delineation boundary, but is shown on the map because of the inherent uncertainty in ground water modeling. The files also mentions an above ground fuel storage tank about 150 feet from the well. Potential contaminants associated with petroleum products include a host of volatile and synthetic organic chemicals. Highway 41 crossing the 0-3 year time of travel boundaries about 0.13 miles from the well is a potential source of every class of regulated contaminant.

Historic Water Quality

Historically, Pend Oreille Valley School has had few water quality problems. Total coliform bacteria were present in a sample tested in August 1997, but were absent from subsequent samples. Nitrate concentrations have fluctuated from undetectable levels to 0.5 mg/l. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/l.

Chloroform, disinfection by product, was present in a concentration of 0.8 µg/l in a sample tested in December 2001. No other volatile organic compounds or synthetic organic compounds have been detected in the well. Radiological contaminants in concentrations below the MCL were been present in a sample tested in 2000. 0.06 mg/l of Barium (MCL = 2 mg/l) was detected in a sample tested in December 1998.

Final Susceptibility Ranking

The Pend Oreille Valley School well ranked moderately susceptible to all classes of regulated contaminants. 8 of the 12 points in the final susceptibility sum are due to unknown risk factors that were scored conservatively. Total scores in each category are summarized on Table 3. The complete analysis worksheet for the well can be found in Attachment A.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

Table 1. Summary of Pend Oreille Valley School Susceptibility Evaluation

Cumulative Susceptibility Scores						
Well Name	System Construction	Hydrologic Sensitivity	Contaminant Inventory			
			IOC	VOC	SOC	Microbial
Well #1	5	5	4	7	7	2
Final Susceptibility Scores/ Ranking						
	IOC		VOC	SOC		Microbial
Well #1	12/Moderate		12/Moderate	12/Moderate		12/Moderate

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

While an effective drinking water protection program is tailored to the specific system, there are strategies that can benefit every public drinking water system. Maintaining and operating a well in conformance with *Idaho Rules for Public Drinking Water Systems* should be the primary tool employed. Every system should have an emergency response plan. There is a simple, fill-in-the-blanks form available on the DEQ website to guide systems through the process.

Pend Oreille Valley School might find it helpful to develop and implement a written testing and maintenance schedule so important routine tasks are done in a timely manner. The school should also investigate ground water stewardship programs that would be suitable additions to the curriculum. Programs like Home*A*Syst for example help well owners assess everyday activities for their potential impact on ground water. Topics include septic tank maintenance; household pesticide and fertilizer use; petroleum product storage and similar activities.

Partnerships with state and local agencies and industry groups should also be established. For instance, source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, local Soil Conservation District, and the Natural Resources Conservation Service. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: www.deq.state.id.us/water/water1.htm

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Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

Pend Oreille Valley School Susceptibility Analysis Worksheets

Ground Water Susceptibility

Public Water System Name : **PEND OREILLE VALLEY SCHOOL** Source: **WELL 1**

Public Water System Number : **1090188** 9/19/02 11:09:59 AM

1. System Construction		SCORE			
Drill Date	1974				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES 2002				
Well meets IDWR construction standards	UNKNOWN	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	UNKNOWN	2			
Highest production 100 feet below static water level	UNKNOWN	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		**4**			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	UNKNOWN	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	UNKNOWN	2			
Total Hydrologic Score		**6**			
		IOC	VOC	SOC	Microbial
3. Potential Contaminant / Land Use - ZONE 1A (Sanitary Setback)		Score	Score	Score	Score
Land Use Zone 1A	RANGELAND, WOODLAND	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		**0**	**0**	**0**	**0**
Potential Contaminant / Land Use - ZONE 1B (3 YR. TOT)					
Contaminant sources present (Number of Sources)	YES HIGHWAY, FUEL STORAGE TANK	1	2	2	1
(Score = # Sources X 2) 8 Points Maximum		2	4	4	2
Sources of Class II or III leacheable contaminants or Microbials	YES	1	2	2	
4 Points Maximum		1	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		**3**	**6**	**6**	**2**
Potential Contaminant / Land Use - ZONE II (6 YR. TOT)					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		**0**	**0**	**0**	**0**
Potential Contaminant / Land Use - ZONE III (10 YR. TOT)					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Agricultural lands occupy > 50% of Zone	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		**1**	**1**	**1**	**0**
Cumulative Potential Contaminant / Land Use Score		**4**	**7**	**7**	**2**
4. Final Susceptibility Source Score		**11**	**11**	**11**	**11**
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

BML (Business Mailing List)– This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

Closed Or Open UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.